

**UNITED STATES DISTRICT COURT  
SOUTHERN DISTRICT OF NEW YORK**

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IN RE AMBAC FINANCIAL GROUP, INC.  
SECURITIES LITIGATION

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)  
) No. 08-CV-411 (NRB)  
)  
) ECF Case  
)

**DECLARATION OF C. LEE WILSON IN SUPPORT OF AMBAC AND  
INDIVIDUAL DEFENDANTS' MOTION TO DISMISS THE  
CONSOLIDATED AMENDED CLASS ACTION COMPLAINT**

1. I am an attorney at the law firm of Wachtell, Lipton, Rosen & Katz, counsel for Defendants in these actions.

2. I respectfully submit this declaration pursuant to 28 U.S.C. § 1746 to submit to the Court certain documents that are referenced in the Ambac and Individual Defendants' Motion to Dismiss the Consolidated Amended Class Action Complaint.

3. For the Court's convenience, for certain documents (which are designated with the word "excerpts" in the chart below) we have excerpted only the portions pertinent to the points made in our brief in order to reduce the bulk of the materials being submitted. We will be pleased to furnish the entire copy of any excerpted document at the request of the Court or plaintiffs' counsel. Also, in some cases (for documents designated with a "\*" in the chart below), pertinent text has been highlighted for the Court's convenience with a black line in the margin next to the pertinent text.

4. Submitted herewith are true and correct copies of the following:

Exhibit	Description
1	Chart depicting Case-Shiller 20-City Composite Index Price Changes and Certain Ambac Announcements of Writedowns, Losses and Loss Reserves (followed by the underlying data as downloaded from the S&P/Case-Shiller website at <a href="http://www2.standardandpoors.com/spf/pdf/index/CSHomePrice_History_093042.xls">http://www2.standardandpoors.com/spf/pdf/index/CSHomePrice_History_093042.xls</a> )
2	"When Fortune Frowned," <i>The Economist</i> , (Oct. 9, 2008)
3	Frank J. Fabozzi, <i>Credit Enhancement for Nonagency MBS Products</i> , in <i>The Handbook of Mortgage Backed Securities</i> 113-22 (6th Ed. 2006)
4	International Monetary Fund <i>Global Financial Stability Report</i> (April 2007) (excerpts)
5	Alan Greenspan, "The Roots of the Mortgage Crisis," <i>Wall St. J.</i> (Dec. 12, 2007)
6	Floyd Norris, "It's a Crisis and Ideas are Scarce," <i>N.Y. Times</i> (Apr. 11, 2008)
7	Eric Dinallo, "Tackle false rumors about insurance companies," <i>Fin. Times (London)</i> (July 31, 2008)
8	Alan Greenspan, "We will never have a perfect model of risk," <i>Fin. Times (London)</i> (Mar. 16, 2008).
9	"Europe Formulates Sweeping Crisis Plan," <i>Wall St. J.</i> (Oct. 12, 2008)
10	Edmund Conway, "IMF warns of world financial system 'meltdown,'" <i>Telegraph (UK)</i> (Oct. 12, 2008).
11	Laurie S. Goodman et al., <i>Subprime Mortgage Credit Derivatives</i> (2008)
12	Ben Logan, "The ABX Index: A Pricing Conundrum," <i>Credit</i> (May 1, 2008)
13	"Don't Mark to Market," <i>Economist</i> (Mar. 6, 2008)
14	Moody's and S&P Ratings for the 5 CDOs that plaintiffs use for their "expert" analysis (Compl. ¶ 118) from issuance through August 2008

15	Alistair Barr, "Pershing's Ackman knocks MBIA, Ambac," <i>MarketWatch</i> (May 24, 2007)
16	Pershing Square, "Who's Holding the Bag?", <i>Ira Sohn Conference</i> (May 2007)
17	Gabrielle Stein, "Ackman Casts First Doubt on Monolines," <i>Asset Securitization Reporter</i> (Jan. 14, 2008).
18	Michael Rudnick, "Ackman targets FSA," <i>Daily Deal</i> (June 20, 2008).
19	Deborah Solomon, "U.S. to Buy Stakes in Nation's Largest Banks," <i>Wall St. J.</i> (Oct. 14, 2008)
20	Carrick Mollenkamp, "Lehman Files for Bankruptcy, Merrill Sold, AIG Seeks Cash," <i>Wall St. J.</i> (Sept. 16, 2008)
21	Robin Sidel, "WaMu is seized, sold off to J.P. Morgan, in largest failure in U.S. banking history," <i>Wall St. J.</i> (Sept. 26, 2008)
22	Deborah Solomon, "Mortgage Bailout is Greeted with Relief, Fresh Questions," <i>Wall St. J.</i> (Sept. 9, 2008).
23	Matthew Karnitschnig, "U.S. to Take Over AIG in \$85 Billion Bailout," <i>Wall St. J.</i> (Sept. 16, 2008)
24	JP Morgan Press Release Announcing Purchase of Bear Stearns
25	Bank of America Press Release Announcing Purchase of Merrill Lynch
26	Wachovia Press Release Announcing Sale to Wells Fargo
27	<i>Painting Industry Insurance and Annuity Funds v. Ambac Assurance Corporation, et al.</i> , No. 08 Civ. 6602 (filed July 25, 2008) (excerpts)
28	Ambac CDO of ABS Data Supplement, available at <a href="http://ambac.com/pdfs/CDO-ABS_Data_Supplement.pdf">http://ambac.com/pdfs/CDO-ABS_Data_Supplement.pdf</a>
29	Ambac Form 10-K for the year 2007, dated February 29, 2008 (excerpts)
30	Ambac Form 10-K for the year 2006, dated March 1, 2007 (excerpts)

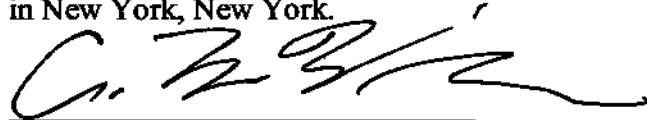
31	Ambac Form 10-K for the year 2005, dated March 13, 2006 (excerpts)
32	Ambac Form 10-K for the year 2004, dated March 15, 2005 (excerpts)
33	Ambac Form 10-K for the year 2003, dated March 15, 2004 (excerpts)
34	Ambac Form 10-K for the year 2002, dated March 28, 2003 (excerpts)
35	Ambac Proxy Statement dated March 30, 2007 (excerpts)
36	Ambac Form 10-Q for 3Q 2007, dated November 9, 2007 (excerpts)
37	Ambac Form 10-Q for 2Q 2007, dated August 9, 2007 (excerpts)
38	Ambac Form 10-Q for 1Q 2007, dated May 10, 2007 (excerpts)
39	Ambac Form 10-Q for 3Q 2006, dated November 8, 2006 (excerpts)
40	Ambac Form 10-Q for 2Q 2006, dated August 9, 2006 (excerpts)
41	Ambac Form 10-Q for 1Q 2006, dated May 10, 2006 (excerpts)
42	Ambac Form 8-K, dated August 1, 2008
43	Ambac Form 8-K, dated November 7, 2007 (excerpts)
44	Ambac Form 8-K, dated July 25, 2007 (excerpts)
45	Ambac Form 8-K, dated January 25, 2008 (excerpts) *
46	Transcript of Ambac 4Q 2007 Earnings call (January 22, 2008)
47	Transcript of Ambac 3Q 2007 Earnings call (October 24, 2007)

48	Transcript of Ambac 2Q 2007 Earnings call (July 25, 2007)
49	Transcript of Ambac 1Q 2007 Earnings call (April 25, 2007)
50	Transcript of Ambac 4Q 2006 Earnings call (January 25, 2007)
51	Transcript of Ambac 3Q 2006 Earnings call (October 25, 2006)
52	Transcript of Ambac 2Q 2006 Earnings call (July 26, 2006)
53	Transcript of Ambac 1Q 2006 Earnings call (April 26, 2006)
54	Transcript of Ambac 4Q 2005 Earnings call (January 25, 2006)
55	Transcript of Ambac 3Q 2005 Earnings call (October 19, 2006)
56	Transcript of Uhlein KBW Conference Presentation, dated June 12, 2007
57	Transcript of Uhlein AIFA Conference Presentation, dated March 2007
58	Ambac March 2008 Common Stock Offering Prospectus Supplement, dated March 6, 2008 (excerpts)
59	Ambac March 2008 Equity Units Offering Prospectus Supplement, dated March 6, 2008 (excerpts)
60	Ambac February 2007 DISCS Offering Prospectus Supplement, dated February 7, 2008 (excerpts)
61	MBIA Forms 8-K, dated October 25, 2007; January 31, 2008; May 12, 2008 (excerpts) *
62	MBIA Historical Stock Prices from May 2007 and June 30, 2008
63	MBIA Forms 8-K, dated June 25, 2008 and June 6, 2008 *
64	Security Capital Assurance Forms 8-K, dated October 25, 2007; March 13, 2008; May 8, 2008 (excerpts) *

65	Security Capital Assurance Historical Stock Prices from May 2007 and July 15, 2008
66	Security Capital Assurance Form 8-K, dated June 23, 2008 *
67	FGIC Press Releases Announcing Quarterly Results, dated October 30, 2007, March 17, 2008, May 23, 2008 (excerpts) *
68	Moody's and S&P Ratings Actions on FGIC dated June 20, 2008 and March 28, 2008 *
69	Moody's Ratings Action on CIFG dated May 20, 2008
70	Ambac Form 8-K, dated October 24, 2007 (excerpts)

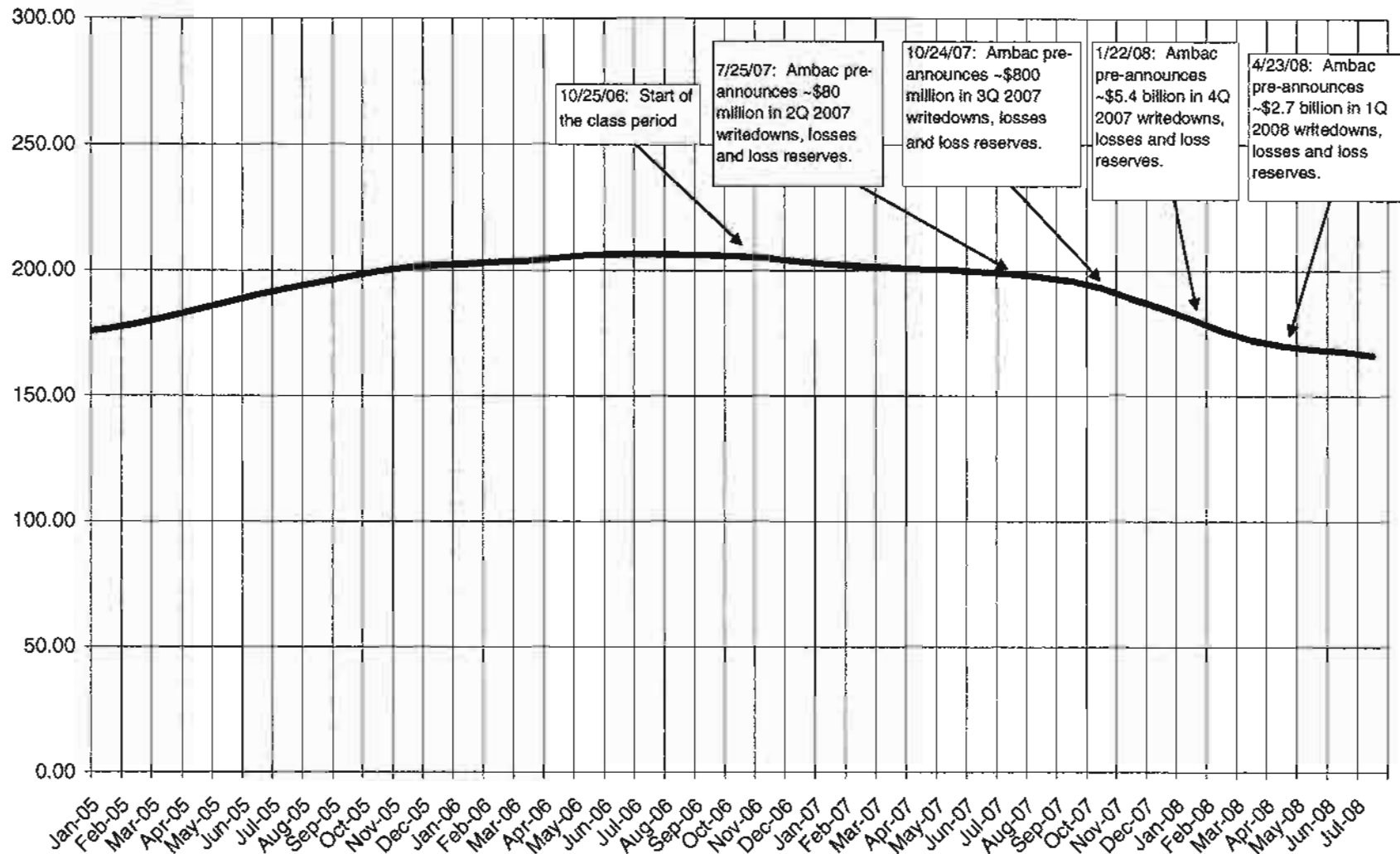
I declare under the penalty of perjury that the foregoing is true and correct.

Executed on October 21, 2008  
in New York, New York.



C. Lee Wilson (CW-7925)

# Exhibit 1

**Exhibit A**Case-Shiller 20-City Composite Index Price Changes  
and Certain Ambac Announcements of Writedowns, Losses and Loss Reserves

Note: This chart was created using the July 2008 S&P/Case-Shiller Home Price Indices data (published Sept. 30, 2008). This data is publicly available on Standard and Poor's website at [http://www2.standardandpoors.com/spf/pdf/index/CSHomePrice\\_History\\_093042.xls](http://www2.standardandpoors.com/spf/pdf/index/CSHomePrice_History_093042.xls). This is the same data underlying the chart plaintiffs rely on in ¶ 106 of the Complaint.



Date	Composite-20 SPCS20R
January 2005	176.44
February 2005	178.50
March 2005	181.30
April 2005	184.24
May 2005	187.21
June 2005	190.10
July 2005	192.67
August 2005	194.98
September 2005	197.36
October 2005	199.40
November 2005	200.97
December 2005	201.97
January 2006	202.44
February 2006	203.19
March 2006	203.65
April 2006	204.82
May 2006	205.86
June 2006	206.38
July 2006	206.52
August 2006	206.18
September 2006	205.80
October 2006	205.41
November 2006	204.65
December 2006	203.33
January 2007	202.31
February 2007	201.57
March 2007	201.01
April 2007	200.53
May 2007	200.12
June 2007	199.44
July 2007	198.71
August 2007	197.37
September 2007	195.69
October 2007	192.97
November 2007	188.94
December 2007	184.98
January 2008	180.70
February 2008	175.97
March 2008	172.20
April 2008	169.99
May 2008	168.59
June 2008	167.71
July 2008	166.23

# Exhibit 2

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## SPECIAL REPORTS

### When fortune frowned

Oct 9th 2008

From The Economist print edition

**The worst financial crisis since the Depression is redrawing the boundaries between government and markets, says Zanny Minton Beddoes (interviewed [here](#)). Will they end up in the right place?**

Illustration by Besie Mellor



AFTER the stockmarket crash of October 1929 it took over three years for America's government to launch a series of dramatic efforts to end the Depression, starting with Roosevelt's declaration of a four-day bank holiday in March 1933. In-between, America saw the worst economic collapse in its history. Thousands of banks failed, a devastating deflation set in, output plunged by a third and unemployment rose to 25%. The Depression wreaked enormous damage across the globe, but most of all on America's economic psyche. In its aftermath the boundaries between government and markets were redrawn.

During the past month, little more than a year after the financial storm first struck in August 2007, America's government made its most dramatic interventions in financial markets since the 1930s. At the time it was not even certain that the economy was in recession and unemployment stood at 6.1%. In two tumultuous weeks the Federal Reserve and the Treasury between them nationalised the country's two mortgage giants, Fannie Mae and Freddie Mac; took over AIG, the world's largest insurance company; in effect extended government deposit insurance to \$3.4 trillion in money-market funds; temporarily banned short-selling in over 900 mostly financial stocks; and, most dramatic of all, pledged to take up to \$700 billion of toxic mortgage-related assets on to its books. The Fed and the Treasury were determined to prevent the kind of banking catastrophe that precipitated the Depression. Shell-shocked lawmakers cavilled, but Congress and the administration eventually agreed.

The landscape of American finance has been radically changed. The independent investment bank—a quintessential Wall Street animal that relied on high leverage and wholesale funding—is now all but extinct. Lehman Brothers has gone bust; Bear Stearns and Merrill Lynch have been swallowed by commercial banks; and Goldman Sachs and Morgan Stanley have become commercial banks themselves. The “shadow banking

system"—the money-market funds, securities dealers, hedge funds and the other non-bank financial institutions that defined deregulated American finance—is metamorphosing at lightning speed. And in little more than three weeks America's government, all told, expanded its gross liabilities by more than \$1 trillion—almost twice as much as the cost so far of the Iraq war.

Beyond that, few things are certain. In late September the turmoil spread and intensified. Money markets seized up across the globe as banks refused to lend to each other. Five European banks failed and European governments fell over themselves to prop up their banking systems with rescues and guarantees. As this special report went to press, it was too soon to declare the crisis contained.

## Anatomy of a collapse

That crisis has its roots in the biggest housing and credit bubble in history. America's house prices, on average, are down by almost a fifth. Many analysts expect another 10% drop across the country, which would bring the cumulative decline in nominal house prices close to that during the Depression. Other countries may fare even worse. In Britain, for instance, households are even more indebted than in America, house prices rose faster and have so far fallen by less. On a quarterly basis prices are now falling in at least half the 20 countries in *The Economist's* house-price index.

The credit losses on the mortgages that financed these houses and on the pyramids of complicated debt products built on top of them are still mounting. In its latest calculations the IMF reckons that worldwide losses on debt originated in America (primarily related to mortgages) will reach \$1.4 trillion, up by almost half from its previous estimate of \$945 billion in April. So far some \$760 billion has been written down by the banks, insurance companies, hedge funds and others that own the debt.

Globally, banks alone have reported just under \$600 billion of credit-related losses and have raised some \$430 billion in new capital. It is already clear that many more write-downs lie ahead. The demise of the investment banks, with their far higher gearing, as well as deleveraging among hedge funds and others in the shadow-banking system will add to a global credit contraction of many trillions of dollars. The IMF's "base case" is that American and European banks will shed some \$10 trillion of assets, equivalent to 14.5% of their stock of bank credit in 2009. In America overall credit growth will slow to below 1%, down from a post-war annual average of 9%. That alone could drag Western economies' growth rates down by 1.5 percentage points. Without government action along the lines of America's \$700 billion plan, the IMF reckons credit could shrink by 7.3% in America, 6.3% in Britain and 4.5% in the rest of Europe.

Much of the rich world is already in recession, partly because of tighter credit and partly because of the surge in oil prices earlier this year. Output is falling in Britain, France, Germany and Japan. Judging by the pace of job losses and the weakness of consumer spending, America's economy is also shrinking.

The average downturn after recent banking crises in rich countries lasted four years as banks retrenched and debt-laden households and firms were forced to save more. This time firms are in relatively good shape, but households, particularly in Britain and America, have piled up unprecedented debts. And because the asset and credit bubbles formed in many countries simultaneously, the hangover this time may well be worse.

But history teaches an important lesson: that big banking crises are ultimately solved by throwing in large dollops of public money, and that early and decisive government action, whether to recapitalise banks or take on troubled debts, can minimise the cost to the taxpayer and the damage to the economy. For example, Sweden quickly took over its failed banks after a property bust in the early 1990s and recovered relatively fast. By contrast, Japan took a decade to recover from a financial bust that ultimately cost its taxpayers a sum equivalent to 24% of GDP.

All in all, America's government has put some 7% of GDP on the line, a vast amount of money but well below the 16% of GDP that the average systemic banking crisis (if there is such a thing) ultimately costs the public purse. Just how America's proposed Troubled Asset Relief Programme (TARP) will work is still unclear. The Treasury plans to buy huge amounts of distressed debt using a reverse auction process, where banks offer to sell at a price and the government buys from the lowest price upwards. The complexities of thousands of different mortgage-backed assets will make this hard. If direct bank recapitalisation is still needed, the Treasury can do that too. The main point is that America is prepared to act, and act decisively.



For the time being, that offers a reason for optimism. So, too, does the relative strength of the biggest emerging markets, particularly China. These economies are not as "decoupled" from the rich world's travails as they once seemed. Their stockmarkets have plunged and many currencies have fallen sharply. Domestic demand in much of the emerging world is slowing but not collapsing. The IMF expects emerging economies, led by China, to grow by 6.9% in 2008 and 6.1% in 2009. That will cushion the world economy but may not save it from recession.

Another short-term fillip comes from the recent plunge in commodity prices, particularly oil. During the first year of the financial crisis the boom in commodities that had been building up for five years became a headlong surge. In the year to July the price of oil almost doubled. *The Economist's* food-price index jumped by nearly 55% (see chart 1). These enormous increases pushed up consumer prices across the globe. In July average headline inflation was over 4% in rich countries and almost 9% in emerging economies, far higher than central bankers' targets (see chart 2).

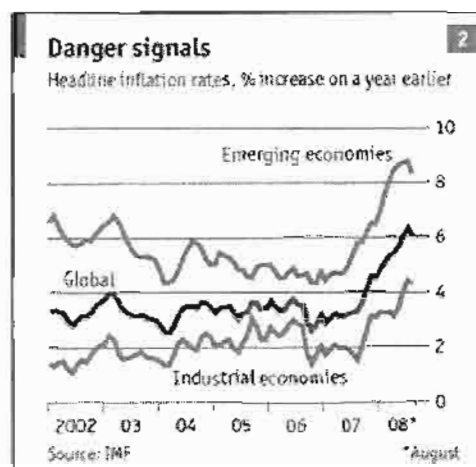
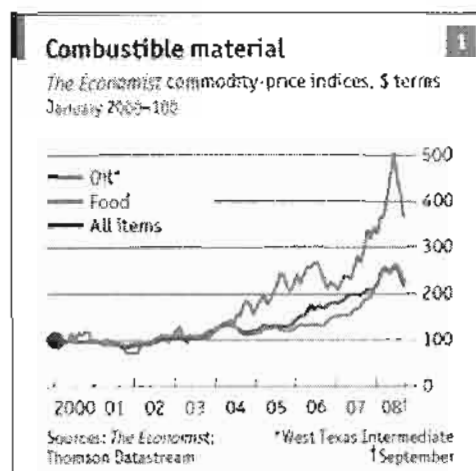
High and rising inflation coupled with financial weakness left central bankers with perplexing and poisonous trade-offs. They could tighten monetary policy to prevent higher inflation becoming entrenched (as the European Central Bank did), or they could cut interest rates to cushion financial weakness (as the Fed did). That dilemma is now disappearing. Thanks to the sharp fall in commodity prices, headline consumer prices seem to have peaked and the immediate inflation risk has abated, particularly in weak and financially stressed rich economies. If oil prices stay at today's levels, headline consumer-price inflation in America may fall below 1% by the middle of next year. Rather than fretting about inflation, policymakers may soon be worrying about deflation.

The trouble is that because of its large current-account deficit America is heavily reliant on foreign funding. It has the advantage that the dollar is the world's reserve currency, and as the financial turmoil has spread the dollar has strengthened. But today's crisis is also testing many of the foundations on which foreigners' faith in the dollar is based, such as limited government and stable capital markets. If foreigners ever flee the dollar, America will face the twin nightmares that haunt emerging countries in a financial collapse: simultaneous banking and currency crises. America's debts, unlike those in many emerging economies, are denominated in its own currency, but a collapse of the dollar would still be a catastrophe.

## Tipping point

What will be the long-term effect of this mess on the global economy? Predicting the consequences of an unfinished crisis is perilous. But it is already clear that, even in the absence of a calamity, the direction of globalisation will change. For the past two decades the growing integration of the world economy has coincided with the intellectual ascent of the Anglo-Saxon brand of free-market capitalism, with America as its cheerleader. The freeing of trade and capital flows and the deregulation of domestic industry and finance have both spurred globalisation and come to symbolise it. Global integration, in large part, has been about the triumph of markets over governments. That process is now being reversed in three important ways.

First, Western finance will be re-regulated. At a minimum, the most freewheeling areas of modern finance, such as the \$55 trillion market for credit derivatives, will be brought into the regulatory orbit. Rules on capital will be overhauled to reduce leverage and enhance the system's resilience. America's labyrinth of overlapping regulators will be reordered. How much control will be imposed will depend less on ideology (both of America's presidential candidates have promised reform) than on the severity of the economic downturn. The 1980s savings-and-loan crisis amounted to a sizeable banking bust, but because it did not result in an economic catastrophe, the regulatory consequences were modest. The Depression, in contrast, not only refashioned the structure of American finance but brought regulation to whole swathes of the economy.



That leads to the second point: the balance between state and market is changing in areas other than finance. For many countries a more momentous shock over the past couple of years has been the soaring price of commodities, which politicians have also blamed on financial speculation. The food-price spike in late 2007 and early 2008 caused riots in some 30 countries. In response, governments across the emerging world extended their reach, increasing subsidies, fixing prices, banning exports of key commodities and, in India's case, restricting futures trading. Concern about food security, particularly in India and China, was one of the main reasons why the Doha round of trade negotiations collapsed this summer.

Third, America is losing economic clout and intellectual authority. Just as emerging economies are shaping the direction of global trade, so they will increasingly shape the future of finance. That is particularly true of capital-rich creditor countries such as China. Deleveraging in Western economies will be less painful if savings-rich Asian countries and oil-exporters inject more capital. Influence will increase along with economic heft. China's vice-premier, Wang Qishan, reportedly told his American counterparts at a recent Sino-American summit that "the teachers now have some problems."

## **The enduring attraction of markets**

The big question is what lessons the emerging students—and the disgraced teacher—should learn from recent events. How far should the balance between governments and markets shift? This special report will argue that although some rebalancing is needed, particularly in financial regulation, where innovation outpaced a sclerotic supervisory regime, it would be a mistake to blame today's mess only, or even mainly, on modern finance and "free-market fundamentalism". Speculative excesses existed centuries before securitisation was invented, and governments bear direct responsibility for some of today's troubles. Misguided subsidies, on everything from biofuels to mortgage interest, have distorted markets. Loose monetary policy helped to inflate a global credit bubble. Provocative as it may sound in today's febrile and dangerous climate, freer and more flexible markets will still do more for the world economy than the heavy hand of government.

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# Exhibit 3

# **THE HANDBOOK OF MORTGAGE-BACKED SECURITIES**

**Sixth Edition**

**FRANK J. FABOZZI, Ph.D., CFA, CPA**

*Editor*

**McGraw-Hill**

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CHAPTER  
SIX

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## **CREDIT ENHANCEMENTS FOR NONAGENCY MBS PRODUCTS**

FRANK J. FABOZZI, Ph.D., CFA, CPA  
Frederick Frank Adjunct Professor of Finance  
School of Management  
Yale University

The investor in nonagency mortgage-backed securities products is exposed to credit risk. Because there is no explicit or implicit government guarantee, all nonagency securities are credit enhanced in order to obtain a specific credit rating for each tranche in a deal. Credit enhancement mechanisms can take various forms, both from external parties and within the structure of the deal. External credit enhancement mechanisms are third-party guarantees. Internal credit enhancement mechanisms are forms of self-insurance. In addition, derivative instruments, specifically interest-rate swaps and interest-rate caps, can be used as a form of credit enhancement. The credit enhancement mechanism(s) used are those that provide the seller with the best execution. That is, it will maximize proceeds from the sale of the pool of mortgage loans after credit enhancement expenses (implicit and explicit) are taken into account.

This chapter examines and explains the various forms and usages of credit enhancement in mortgage-backed securities (MBS) and mortgage-related asset-backed securities (ABS). It discusses issues related to both internal and external credit enhancement and how differences in collateral quality and expected credit performance influence the form and amount of enhancement needed. It concludes with a discussion of how interest-rate derivatives are used for hedging interest-rate risk.

### **EXTERNAL CREDIT ENHANCEMENTS**

External credit enhancements come in the form of third-party guarantees that provide for first-loss protection against losses up to a specified amount. Historically, the most common forms of external credit enhancements have been (1) a letter of

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The author is grateful to Bill Berliner and Jonathan Lieber of Countrywide Securities; Brian Grow, Ray Morel, and Weili Chen of Standard & Poor's; and Patrick Fitzsimonds of UBS for their helpful comments.

credit, (2) bond insurance, and (3) pool insurance. A structure with external credit support is subject to the credit risk of the third-party guarantor. Should the third-party guarantor be downgraded, the tranches of a transaction guaranteed by that entity could be subject to downgrade depending on the historical performance of the collateral. This is the chief disadvantage of third-party guarantees.

External credit enhancements do not materially alter the cash-flow characteristics of a structure except in the form of prepayment. In case of a default resulting in credit losses within the guarantee level, investors will receive the principal amount as if a prepayment has occurred. If the credit losses exceed the guarantee level, investors may realize a shortfall in the cash flow.

### Letter of Credit

A bank letter of credit (LOC), one of the oldest forms of credit enhancement but one that has been used rarely in recent years, is a financial guarantee by the issuing bank. The financial guarantee specifies that the issuing bank is committed to reimburse credit losses up to a predetermined amount. In the case of nonagency MBS products, a top-rated international bank is used to provide coverage of credit losses on the underlying mortgage pool that is less than 100% of the pool but an amount sufficient to obtain a triple-A rating.

There are two reasons for the decline in the popularity of LOCs for credit enhancing nonagency MBS products. First, there are few banks that have retained triple-A ratings, and even for those that have, there is the risk that they will be downgraded in the future. As noted earlier, a downgrading may result in the downgrading of the affected tranches. Second, risk-based capital requirements have changed since this form of credit enhancement was first popular. These requirements made it more expensive for banks to issue a letter of credit, thereby increasing the cost to entities seeking to use it as a form of credit enhancement.

### Bond Insurance<sup>1</sup>

Bond insurance, also called a *surety bond*, is a financial guarantee from a monoline insurance company. The guarantee is for the timely payments of principal and interest if these payments cannot be satisfied from the cash flow from the underlying mortgage pool. The principal payments will be made without acceleration, except if the insurer elects to do so. The monoline insurers that are primary insurers are Ambac Assurance Corporation (Ambac), Financial Guaranty Insurance Corporation (FGIC), Financial Security Assurance (FSA), Municipal

1. For a more detailed discussion of bond insurance, see Mahesh K. Kotecha, "The Role of Financial Guarantees in Asset-Backed Securities," Chapter 6 in Frank J. Fabozzi (ed.), *Issuer Perspectives on Securitization* (Hoboken, NJ: Wiley, 1998).

Bond Insurance Corporation (MBIA), and BIAXLCA/XLFA, whereas the reinsurers are ACE Guaranty Re, AXA Re Finance, Enhance Re, and RAM Re.

Based on historical experience with financial guarantees by monoline insurers, capital market participants have a high degree of confidence in bond insurance because no investor in any bond-insured security failed to receive a single timely payment of principal or interest. Moreover, downgrade risk is viewed as minimal because no U.S. financial guarantee company has been downgraded. Investors realize another benefit from bond insurance. While rating agencies face reputational risk when assigning a rating to a security, monoline insurers are placing their own capital and credit rating at risk. Hence investors can correctly expect that the transaction structure is inherently safe and will remain so over the life of the securities guaranteed.

### Pool Insurance

Bond insurance covers losses resulting from defaults and foreclosures. Policies typically are written for a dollar amount of coverage that continues in force throughout the life of the pool. Since only defaults and foreclosures are covered, additional insurance must be obtained to cover losses resulting from bankruptcy, fraud arising in the origination process, and special hazards. Each of these is discussed below.

When a borrower files for personal bankruptcy, there is a risk that a bankruptcy judge could reduce the borrower's mortgage debt. This debt reduction, called a *cramdown*, usually occurs only when the value of the borrower's home has fallen so that the mortgage loan balance exceeds the home's market value. If a cramdown is ordered, the loan's terms can be altered by reducing the unpaid principal balance or the loan's interest rate. A few cramdowns have occurred in recent years in settling Chapter 13 bankruptcy cases.<sup>2</sup> However, the 1993 Supreme Court case of *Nobelman versus American Savings* ruled that a borrower filing under Chapter 13 cannot effectively reduce his or her mortgage debt.

Another potential risk that the cash flows will be impaired arises from borrower fraud or misrepresentation during the application process. This type of risk often is not covered by the originator/conduit/sellers' representations and warranties. The risk of losses owing to fraud is front-loaded. That is, borrowers who misrepresent their income, employment, or net worth generally will run into payment problems early in the loan's life. Therefore, fraud coverage is largest at issuance.

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2. A mortgage borrower can file for personal bankruptcy under Chapter 7, Chapter 11, or Chapter 13. Chapter 13 allows for restructuring or forgiving debts while letting borrowers retain their assets. In a Chapter 7 bankruptcy filing, a type of bankruptcy that generally involves liquidation of assets to make payments to creditors, cramdowns also have been disallowed under a Supreme Court ruling. Cramdown filings under Chapter 11 are more rare than those under Chapter 7 or Chapter 13 because of their cost and complexity. Jumbo loan borrowers are more likely to file under Chapter 11 because this section can be used only when the debtor's secured debt exceeds \$350,000.

Special-hazard losses result from properties damaged by earthquakes, mud slides, tidal waves, volcanoes, or floods. Such losses are excluded from coverage under homeowners' and private mortgage insurance policies. Subordinate tranches absorb special-hazard losses up to a predetermined capped amount that declines as the mortgage pool amortizes. This "capped" amount is determined by the rating agencies. Special-hazard losses in excess of this capped amount are distributed among the senior and subordinate classes pro rata. Historically, losses from special hazards are quite rare because special casualty insurance often is required on homes in high-risk areas (i.e., flood insurance in flood zones and earthquake insurance along known fault lines), and damage caused indirectly by an act of God, such as water damage or fire caused by an earthquake, can be covered under standard homeowners' policies.<sup>3</sup>

## INTERNAL CREDIT ENHANCEMENTS

Internal credit enhancements come in more complicated forms than external credit enhancements and may alter the cash-flow characteristics of the loans even in the absence of default. Credit enhancement levels (i.e., the amount of subordination for each form of enhancement used within a deal) are determined by the rating agencies from which the issuer seeks a rating for the tranches. This is referred to as "sizing" the transaction and is based on the rating agencies' expectations for the performance of the loans collateralizing the deal in question. Typically, a triple- or double-A rating is sought for the deal's most senior tranches. The type and amount of credit enhancement used in a deal represent the intersection of the issuer's need to maximize deal proceeds and the rating agencies' judgment with respect to how much credit enhancement is required to bestow the desired rating on the senior tranches.

The most common forms of internal credit enhancements are senior/subordinate structures, overcollateralization, and reserve funds. The credit enhancement forms are used both individually and in combination, depending on the loan types in question. Typically, loan products where credit performance is historically strong (e.g., prime jumbo fixed-rate loans) are executed in senior/subordinate structures because the credit enhancement required is relatively small, and the senior/subordinate structure offers efficient execution. Deals backed by lower-quality loans require higher levels of enhancement and typically use a combination of the above-referenced credit enhancement forms.

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3. Another important factor is land value. In costly areas of the country, the value of land can represent more than 50% of the value of a single-family home. Thus, if a home is totally destroyed, the land value acts as a floor in terms of the loan's loss severity. Finally, where damage to property caused by special hazards is uninsured, the homeowner often can get access to low-cost government funds to help rebuild. Therefore, special hazards historically have not resulted in significant losses. In addition, geographic diversification can help to limit a pool's exposure to special-hazard risk.

Most structured transactions that employ internal credit enhancements follow a predetermined schedule that prioritizes the manner in which principal and interest generated by the underlying collateral must be used. This schedule, which is set down in the deal's prospectus, is known as the *cash-flow waterfall* or, simply, the *waterfall*. At the top of the waterfall would be cash flows owing to senior bondholders (interest and principal, depending on the principal payment schedule), as well as some standard fees and expenses (e.g., the servicing fee). After the cash-flow obligations at the top of the waterfall are met, cash flows down to lower-priority classes (AA, A, BBB tranches, etc.).

The cash flows that remain after all the scheduled periodic payment obligations are met is the excess spread. In a sense, therefore, this excess spread is the first line of defense against collateral losses because deals that are structured to have a large amount of excess spread can absorb relatively large levels of collateral losses. If the excess spread is fully eaten away by losses, the next-lowest-rated class will begin to be negatively affected by credit losses. While all deals have a waterfall, the term is used most commonly in deals collateralized by subprime loans and other products that required larger amounts of credit enhancement.

### Senior/Subordinate Structure

The most widely used internal credit enhancement structure is by far the senior/subordinate structure. Today, a typical structure will have a senior tranche and one or more subordinate tranches. The issuer will seek a triple-A or double-A rating for the senior tranche. The subordinate tranches will have lower ratings—investment grade and noninvestment grade. Typically, the most junior subordinate tranche—referred to as the “first-loss piece”—will not be rated.

Exhibit 6–1 shows a hypothetical \$400 million structure with a senior tranche representing 92.25% of the deal and five subordinate tranches representing 7.75% of the deal. Note that all that has been done in this structure is “credit tranching.”

#### EXHIBIT 6–1

Hypothetical \$400 Million Senior/Subordinate Structure

Bond	Rating	Amount (\$millions)	Percent of deal (%)
Senior	AAA	\$369	92.25
Subordinate:			
X1	AA	8.00	2.00
X2	A	4.00	1.00
X3	BBB	6.00	1.50
X4	BB	8.00	2.00
X5	Not rated	5.00	1.25

The senior or any of the subordinate tranches then can be carved up to create other tranches such as sequential pays.

The first-loss piece in this hypothetical deal is tranche X5. The subordination level in this hypothetical structure is 7.75%. The subordinate tranches will absorb all losses up to \$31 million, and the senior tranche will start to experience losses thereafter. Thus, if there is a \$20 million loss, no loss will be realized by the senior tranche. If, instead, there is a \$40 million loss, the senior tranche will experience a loss of \$9 million (\$40 million minus \$31 million), or a 2.4% loss (\$9/\$369).

In the case where the loss is \$20 million, tranches X5, X4, and X3 absorb \$19 million. These tranches will realize a loss experience of 100%. Tranche X2 will realize a loss of \$1 million, thereby having a loss experience of 25% (\$1/\$4). Tranche X1 will not realize any loss. If the loss is \$40 million, all subordinate tranches will have a loss experience of 100%.

The subordinate tranches obviously would require a yield premium in order for an investor to take on the greater credit risk exposure relative to the senior tranche. This setup is another form of self-insurance wherein investors in the senior tranche are giving up yield spread to the investors in the subordinate tranches. This form of credit enhancement still does not affect cash-flow characteristics of the senior tranche except in the form of prepayment. To the extent that losses are within the subordination level, investors in the senior tranche will receive principal as if a prepayment has occurred.

Almost all existing senior/subordinate structures also incorporate a shifting interest structure. This structure redirects principal prepayments and certain liquidation proceeds disproportionately from the subordinate tranche to the senior tranche according to a specified schedule. The rationale for the shifting interest structure is to have enough subordinate tranches outstanding to cover future credit losses.<sup>4</sup> I will discuss the shifting interest structure next.

#### **Senior/Subordinate Structure with a Shifting Interest Mechanism**

The basic credit concern that investors in the senior tranche have is that while the subordinate tranches provides a certain level of credit protection for the senior tranche at the closing of the deal, the level of protection may deteriorate over time owing to prepayments and certain liquidation proceeds. The objective is to distribute these payments of principal such that the credit protection for the senior tranche does not deteriorate over time.

The percentage of the mortgage balance of the subordinate tranche to that of the mortgage balance for the entire deal is called the *level of subordination* or the *subordinate interest*. The higher the percentage, the greater is the level of protection. The subordinate interest changes after the deal is closed owing to prepayments and certain liquidation proceeds. That is, the subordinate interest shifts (hence the term *shifting interest*). The purpose of a shifting interest mechanism is to allocate

4. Because of the shifting interest structure, the subordination amount actually may grow in time, especially in a low-default and fast-prepayment environment. This is sometimes referred to as "riding up the credit curve."



prepayments and certain liquidation proceeds so that the subordinate interest is maintained at an acceptable level to protect the senior tranche.

Now let's be more specific about how the shifting interest mechanism works. The *senior percentage* is defined as the ratio of the balance of the senior tranche to the balance of the entire deal. It is also called the *senior interest* and is equal to 100% minus the subordinate interest. The prospectus will specify how different types of principal repayments will be allocated between the senior tranche and the subordinate tranche. There are five types of principal repayments:

1. Scheduled principal payments
2. Prepayments (full and partial)
3. Repurchase principal
4. Recovery principal
5. Realized losses (principal portion)

The scheduled principal payments are allocated based on the senior percentage. Thus, if in some month the senior percentage is 82% and the scheduled principal payment is \$1 million, the senior tranche will get \$820,000 and the subordinate tranche \$180,000.

Allocation of the other four types of principal repayments is based on the *senior prepayment percentage*.<sup>5</sup> This is defined as follows:

$$\text{Senior percentage} + \text{shifting interest percentage} \times \text{subordinate interest}$$

The shifting interest percentage in this formula is specified in the prospectus, and I will provide an illustration shortly. To illustrate the formula, suppose that in some month the senior interest is 82%, the subordinate interest is 18%, and the shifting interest percentage is 70%. The senior prepayment percentage for that month is

$$82\% + 0.70 \times 18\% = 94.6\%$$

Thus, if prepayments for the month are \$100,000, then \$94,600 is allocated to the senior tranche and \$5,400 to the subordinate tranche.

The prospectus will provide the shifting interest percentage schedule for calculating the senior prepayment percentage. For fixed-rate mortgages, a commonly used shifting interest percentage schedule is as follows:

Year after Issuance	Shifting Interest Percentage
1-5	100
6	70
7	60
8	40
9	20
After year 9	0

5. In some deals it is called the *accelerated-distribution percentage*.



The shifting interest percentage schedule given in the prospectus is the “base” schedule. The schedule can change over time depending on the performance of the collateral. If the performance is such that the credit protection is deteriorating or may deteriorate, the base shifting interest percentages are overridden, and a higher allocation of prepayments is made to the senior tranche. Performance analysis of the collateral is undertaken by the trustee for determining whether to override the base schedule. The performance analysis is in terms of tests, and if the collateral or structure fails any of the tests, this will trigger an override of the base schedule. These tests include the principal loss test, the delinquency test, and the balance test. I will discuss these shortly.

While the shifting interest structure is beneficial to the senior tranche holder from a credit standpoint, it does alter the cash-flow characteristics of the senior tranche even in the absence of defaults. The size of the subordination also matters. A larger subordinate class redirects a higher proportion of prepayments to the senior class, thereby shortening the average life even further.<sup>6</sup>

Most senior/subordinate structures provide a “carve-out” for fraud. The carve-out sets aside a small portion of the deal’s collateral to absorb losses due to fraud.

### Overcollateralization

The total par value of the tranches is the liability of the structure. Thus, if a structure has two tranches with a par value of \$400 million, then this is the amount of the liability. The amount of the collateral backing the structure must be at least equal to the amount of the liability. If the amount of the collateral exceeds the amount of the liability of the structure, the deal is said to be *overcollateralized*. The amount of overcollateralization represents a form of internal credit enhancement because it can be used to absorb losses. For example, if the liability of the structure is \$400 million and the collateral’s value is \$410 million, then the structure is overcollateralized by \$10 million. Thus the first \$10 million of losses will not result in a loss to any of the tranches in the structure.

Overcollateralization can be generated after the transaction *closes* through excess spread. In addition, the collateral in a transaction may be divided into separate groups, each supporting a separate class of bonds. An example occurs in home equity loan transactions, where some classes of bonds are supported by fixed-rate loans and

6. It may be counterintuitive that the size of the subordination should affect the average life and cash flow of the senior class more than the credit quality. This is so because the size of the subordination is already factored into the rating. The rating agency typically requires more subordination for lower-credit-quality loans to obtain a triple-A rating and less subordination for better-credit-quality loans. From a credit standpoint, the investor may be indifferent between a 5% subordination on a package of good-quality loans and a 10% subordination on a package of lower-quality loans as long as the rating agency gives them the same rating. However, the quality of the underlying loans will determine the default rate and therefore the timing of the cash flow.

other classes of bonds are supported by adjustable-rate loans. As explained next, each group of assets will have excess spread. The excess spread will be used first to support the class of bonds created from the same group of loans. After the spread is used to enhance the class of bonds it supports, any remaining spread can be used to enhance the class of bonds of other loan groups. This feature is called a *cross-support provision*, and this type of enhancement is called a *cross-collateralization*. The manner and conditions for applying a cross-support provision are explained in the prospectus supplement.

### Reserve Funds

*Reserve funds* come in two forms, cash reserve funds and excess spread. *Cash reserve funds* are straight deposits of cash generated from issuance proceeds. In this case, part of the underwriting profits from the deal are deposited into a hypothecated fund that typically invests in money market instruments.

*Excess spread accounts* involve the monthly allocation of excess spread or cash into a separate reserve account after paying out the net coupon, servicing fee, and all other expenses. For example, suppose that (1) the gross weighted-average coupon (gross WAC) for the mortgage pool is 7.75%, (2) the servicing and other fees are 0.25%, and (3) the net weighted-average coupon (net WAC) of the bond classes issued is 7.25%. This means that there is excess servicing of 0.25% (7.75% minus 0.25% minus 7.25%). The amount in the reserve account will increase gradually and can be used to pay for possible future losses.

The excess spread is analogous to the guarantee fee paid to the issuer of an agency MBS except that this is a form of self-insurance. As described previously, excess spread acts as the first line of credit support for the deal. This form of credit enhancement relies on the assumption that defaults occur infrequently in the very early life of the loans but increase gradually in the following two to five years, an assumption consistent with the Public Securities Association's (PSA's) standard default assumption (SDA) curve.

If losses on a deal are low, the excess spread will increase. At this point, the excess spread can be deployed within the deal in a number of forms. In some deals, some of the excess spread may be used to pay additional principal to bonds within the deal. Generally speaking, however, the excess spread is part of the "equity" of a deal. At some point, excess spread will be released to either the owner of the deal's "residual" tranche (i.e., the equity interest in the deal) or to bonds in the deal that are structured to receive these cash flows. Such bonds are referred to as "net interest margin" (NIM) securities.

An important feature in analyzing senior/subordinate tranches is the deal's step-down provisions. These provisions allow for the reduction in credit support over time. As noted earlier, a concern that investors in the senior tranche have is that if the collateral performance is deteriorating, step-down provisions should be altered. The provisions that prevent the credit support from stepping down are called *triggers*. Principal payments from the subordinate tranches are diverted to

the senior tranche if a trigger is reached. The diversion of principal varies from issuer to issuer. The most conservative approach is to stop all principal payments from being distributed to the subordinate tranches. Alternatively, some issuers allow the subordinate tranches to receive regularly scheduled principal (amortization) on a pro rata basis but divert all prepayments to the senior tranche.

There are two triggers based on the level of credit performance required to be passed before the credit support can be reduced: a delinquency trigger and a loss trigger. The triggers are expressed in the form of a test that is applied in each period. The *delinquency test*, in its most common form, prevents any step-down from taking place as long as the current over 60-day delinquency rate exceeds a specified percentage of the then-current pool balance. The *principal-loss test* prevents a step-down from occurring if cumulative losses exceed a certain limit (which changes over time) of the original balance of the mortgage pool.

In addition to triggers based on the performance of the collateral, there is a *balance test*. This test involves comparing the change in the senior interest from the closing to the current month. If the senior interest has increased, the balance test is failed, triggering a revision of the base schedule for the allocation of principal payments from the subordinate tranches to the senior tranche. Unlike a trigger that will increase the allocation to the senior tranche, there are balance tests that will increase the allocation to the subordinate tranche. This can occur where the subordinate interest improved by a significant amount. This amount is set forth in the prospectus. For example, the prospectus may set forth that if the subordinate interest doubles, the base schedule is overridden such that more is allocated to the subordinate tranche.

In discussing internal credit enhancement, it should be emphasized that the goal is to optimize the conflicting needs to create protection for the higher-rated tranches in the deal while maximizing deal proceeds. The market has developed certain structuring conventions for different products and sectors. For example, prime jumbo deals generally receive credit enhancement through a series of subordinate tranches; credit enhancement for subprime deals generally will use a combination of subordination, reserve accounts, and overcollateralization. An important point of note is that these conventions are not dictated by regulatory fiat but are created where credit protection and economic efficiency intersect.

## USE OF INTEREST-RATE DERIVATIVE INSTRUMENTS

I conclude this chapter with a discussion of the use of interest-rate derivatives in nonagency MBS products to hedge interest-rate risk. The three types of interest-rate derivatives used in recent mortgage securitizations have been interest-rate swaps, interest-rate caps, and interest-rate corridors. These derivatives are over-the-counter or dealer products, not exchange-traded products. As a result, they expose the trust to counterparty risk.

The use of derivatives in a transaction will be specified in the prospectus supplement as a “permitted asset.” For example, here is the enabling language in the

# Exhibit 4

# World Economic and Financial Surveys

## Global Financial Stability Report

### Market Developments and Issues

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**APR 07**

# World Economic and Financial Surveys

## **Global Financial Stability Report** Market Developments and Issues

**April 2007**



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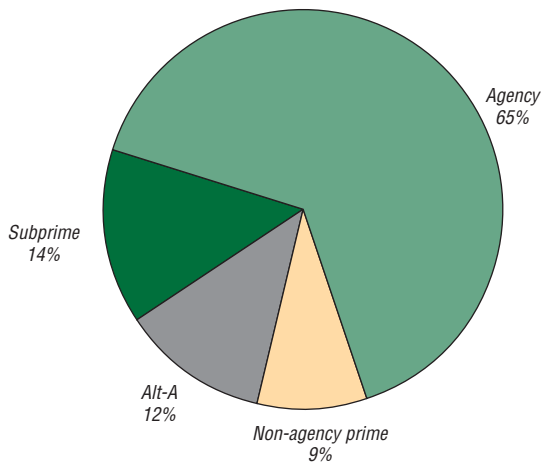
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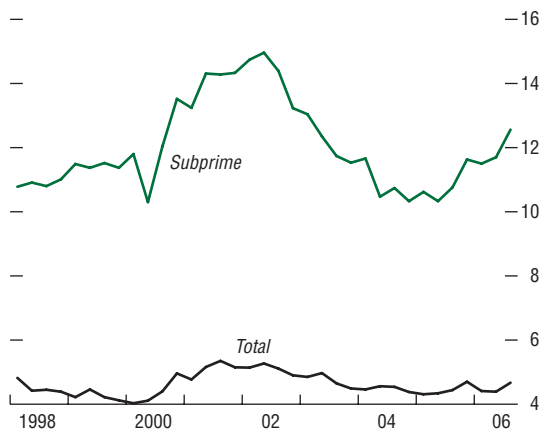
## CHAPTER I ASSESSING GLOBAL FINANCIAL RISKS

**Figure 1.2. Residential Mortgage-Related Securities Market**  
(*\$5.8 trillion as of January 2007*)



Sources: Credit Suisse, LoanPerformance.  
Note: Includes only first lien securitized mortgages. Estimates are based on a securitization rate of 75 percent.

**Figure 1.3. Mortgage Delinquency Rates**  
(*In percent of total loans*)



Source: Mortgage Bankers Association.

For these reasons, market risks are assessed as being greater.<sup>1</sup>

The sections that follow assess specific issues raised in the different risk areas of the global financial stability map.

### Deterioration in the U.S. Subprime Mortgage Market—What Are the Spillover Risks?

This section explores the extent to which the cooling U.S. housing sector and a consequent rise in credit risk could pose a risk to financial stability, including potential spillovers of that risk to global investors. U.S. residential mortgage-related securities represent one of the largest pools of fixed-income securities in the world, totaling around \$5.8 trillion as of January 2007.<sup>2</sup> Non-U.S. holdings of these securities, estimated at \$850 billion as of mid-2006, represent a significant portion of foreign holdings of U.S. securities.<sup>3</sup> Because credit risk is highly concentrated among subprime borrowers—i.e., those borrowers with impaired or limited credit histories—it is important to study the U.S. mortgage market, since it is one of the few markets where such borrowers represent a notable portion of the overall market.<sup>4</sup> At an estimated \$824 billion, the stock of securitized subprime mortgages

<sup>1</sup>This also illustrates the linkages between the various components of the map. Carry trades are popular as a result of the relatively easy monetary and financial conditions and the rising level of risk appetite. But the buildup of such positions represents a market risk. When those conditions change and carry trades as well as other strategies that involve leverage and the selling of insurance (credit default swaps) no longer look attractive, there is clear potential for perturbations across a wide range of markets.

<sup>2</sup>This estimate includes only first lien agency and nonagency mortgage-related securities. An estimate of all mortgage debt exceeds \$13 trillion.

<sup>3</sup>Non-U.S. holdings of mortgage-related securities represented an estimated 10 to 12 percent of total foreign holdings of U.S. securities as of end-2005.

<sup>4</sup>See Bank for International Settlements (BIS) Committee on the Global Financial System (2006). The BIS attributes the lack of a subprime market elsewhere in part to consumer protection laws in some countries that cap mortgage lending rates, thus making it insufficiently profitable for mortgage lenders to lend to high-risk borrowers.



DETERIORATION IN THE U.S. SUBPRIME MORTGAGE MARKET—WHAT ARE THE SPILLOVER RISKS?

represents roughly 14 percent of outstanding mortgage-related securities (Figure 1.2).

The U.S. housing market cooled significantly in 2006 as sales fell and inventories rose sharply. So far, the resulting credit deterioration has been primarily confined to subprime mortgages, though it has begun to spread to Alt-A mortgages.<sup>5</sup> Subprime delinquency rates have picked up from cyclical lows in 2005, though they remain substantially below the previous cyclical peak in 2002 (Figure 1.3).<sup>6</sup> However, many market participants expect subprime delinquency rates to eventually surpass previous peaks. Indeed, growth rates of subprime delinquencies for recent mortgage vintages, notably 2006, are on steeper trajectories than the previously steepest vintage of 2000 (Figure 1.4).

This deterioration reflects a combination of regional economic factors and a shift in the structure of the U.S. mortgage market over the last few years. Specifically, the weaker mortgage collateral has partly been associated with adverse trends in employment and income in specific U.S. states rather than with particularly rapidly rising housing markets.<sup>7</sup>

In addition, a prolonged period of high home price appreciation coincided with a relaxation in underwriting standards, resulting in a rise in the proportions of less creditworthy borrowers, more highly leveraged loans, and more risky mortgage structures (Figure 1.5).<sup>8</sup> The

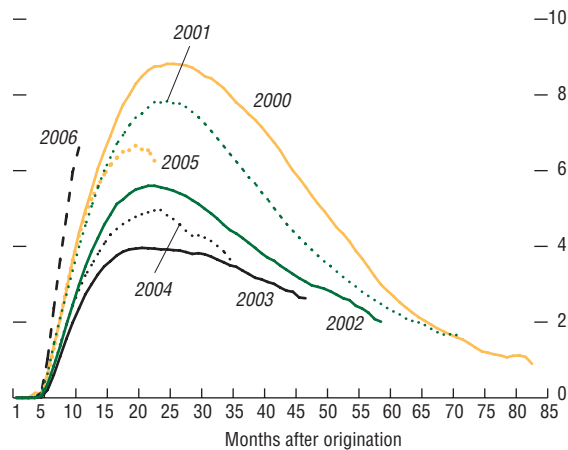
<sup>5</sup>Alt-A mortgages, though of higher quality than subprime mortgages, are considered less than prime credit quality due to one or more nonstandard features related to the borrower, property, or loan that are usually associated with such mortgages.

<sup>6</sup>Other measures of mortgage credit deterioration show a similar trend, such as foreclosures and early payment defaults, generally defined as mortgage loans that are more than 30 days delinquent within six months of the start of the mortgage.

<sup>7</sup>Home price increases have been below the national average in nine of the 10 states with the highest concentration of problem loans. A number of these states have suffered large losses of manufacturing jobs, especially associated with the downturn in the auto industry.

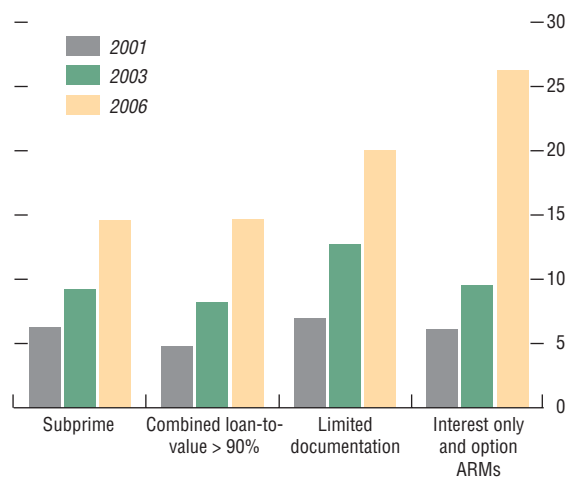
<sup>8</sup>Such mortgages include interest-only and option ARMs, which offer borrowers a range of payment options that can include negative amortization, i.e., payments less than the total interest due.

**Figure 1.4. Subprime 60-Day Delinquencies by Mortgage Vintage Year**  
(In percent of payments due)



Sources: Merrill Lynch; and Intex.

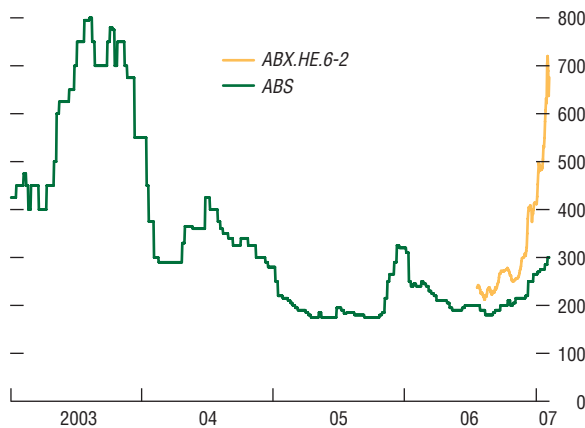
**Figure 1.5. U.S. Mortgage Universe**  
(In percent of total mortgages)



Source: Lehman Brothers.  
Note: ARM = adjustable rate mortgage.

## CHAPTER I ASSESSING GLOBAL FINANCIAL RISKS

**Figure 1.6. Synthetic (ABX) and Cash (ABS) BBB- Subprime Spreads**  
(In basis points)



Sources: JPMorgan Chase & Co.; and Markit.

proliferation of so-called affordability products, which were intended to minimize borrowers' initial monthly payments, has exposed borrowers to payment shock, or substantial increases in monthly payments, as adjustable rate mortgages (ARMs) reset to a higher rate, low introductory rates expire, or mortgages start to amortize.<sup>9</sup> Subprime mortgages are especially exposed to such payment shocks, since a disproportionate share originated as ARMs.<sup>10</sup> Once faced with payment shock, borrowers with limited built-up equity may be unable to avoid default by extracting that equity to meet monthly payments. Similarly, they may be unable to pay off a mortgage by selling their home, particularly in an environment of weak home price appreciation. Either way, this is likely to boost the overall rate of default on subprime mortgages.

At the same time, recent U.S. regulatory guidance that tightened underwriting standards on nontraditional mortgages could exacerbate risk in the short term by reducing the refinancing options for subprime borrowers just as their mortgages are resetting to a higher rate, though some market participants believe underwriters were already tightening standards anyway. The regulatory changes may ultimately strengthen underwriting standards in the longer term, but they have no impact on previously originated mortgages.

The deterioration in the credit quality of subprime mortgages has, in turn, translated into wider spreads on securities collateralized by them. Spreads on BBB- asset-backed home equity loan (HEL) securities, which are collateralized by subprime mortgages, have widened 175 basis points since August. Credit default

<sup>9</sup>Conventional ARMs, which are fully amortizing from the beginning of their term, are subject to payment shock as underlying interest rates rise. A "teaser rate," or a low interest rate, is often offered to attract borrowers to ARMs, but it then rises at each rate adjustment period. Interest-only and option ARMs also embed such payment shocks in their structure at the time they become amortizing. Market participants estimate that around \$1.1 trillion to \$1.5 trillion of such loans will be reset this year.

<sup>10</sup>Roughly 85 percent of subprime loans are ARMs, whereas only 55 to 60 percent of prime and Alt-A loans are ARMs, and less than 20 percent of agency loans.

## DETERIORATION IN THE U.S. SUBPRIME MORTGAGE MARKET—WHAT ARE THE SPILLOVER RISKS?

**Table 1.1. Stress Test: Impact of Home Price Appreciation (HPA) on Asset-Backed Securities (ABS) Collateralized by Subprime Mortgage Loans**  
(Percent impairment of ABS tranches)

Tranche	Home Price Appreciation Scenarios (Average 5-year HPA in percent per year)								Memo Item: Percent of subprime deals in 2006 <sup>1</sup>
	-12	-8	-4	0	4	8	12	16	
AAA	0	0	0	0	0	0	0	0	75.0
AA	0	0	0	0	0	0	0	0	10.1
A	79	48	0	0	0	0	0	0	4.5
BBB	100	100	96	32	0	0	0	0	2.9
BB	100	100	100	100	25	0	0	0	0.7

Source: Lehman Brothers.

<sup>1</sup>Not rated or not available amounts to 6.7 percent.

swaps (CDS) on these securities, where—in contrast to the cash market—investors can take an outright short position to express a negative view on subprime credit, have widened by even more, particularly on those backed by more recent mortgages. Spreads on BBB- rated indices of ABX (indices of CDS on subprime securities) have widened sharply since November (Figure 1.6 and Box 1.1).

This weakness has been contained to certain portions of the subprime market (and, to a lesser extent, the Alt-A market), and is not likely to pose a serious systemic threat. Stress tests conducted by investment banks show that, even under scenarios of nationwide house price declines that are historically unprecedented, most investors with exposure to subprime mortgages through securitized structures will not face losses. These stress tests simulate how slowing house price appreciation would produce losses for asset-backed securities (ABS) collateralized by subprime mortgages. The stress test illustrated in Table 1.1 shows that tranches rated A and higher would not face losses unless house prices fell 4 percent per year for five years.<sup>11</sup>

<sup>11</sup>The illustrated stress test is by Lehman Brothers and it used loan-level data for subprime mortgage loans that were originated during 1999–2005. These data were used to estimate losses for subprime collateral under different house price scenarios. Those losses were then applied to representative ABS deals using private deal modeling software in order to determine the extent of losses for each tranche of the securities. Stress tests by Bear Stearns and JPMorgan give qualitatively similar results.

This is because the lower-rated tranches absorb the risk of default first. Since, typically, nearly 90 percent of subprime ABS deals are rated A or higher, this suggests the amount of potential credit loss in subprime mortgages may be fairly limited. In fact, even the relatively risky BBB tranches only begin to face losses once housing prices fall by 4 percent per year.<sup>12</sup>

### Potential Spillovers to Credit Markets and Market Participants

Notwithstanding that the impact of a cooling housing market has been primarily confined to subprime mortgages and securities issued on them, the growth in the subprime segment of the mortgage market and its increased linkages to various types of securities mean that shocks could create some of the following dislocations in broader asset markets:

- *Looser credit standards may extend beyond the subprime sector.* There is a risk that other higher-quality mortgage collateral may be subject to the same underwriting weaknesses observed in the subprime sector. For instance, more recent vintages of Alt-A mortgages show higher leverage ratios, lower credit scores, lower levels of documentation, more lax requirements for insurance, and other riskier characteristics

<sup>12</sup>The latest data from the Office of Federal Housing Enterprise Oversight show housing price appreciation for the fourth quarter of 2006 running at 5.9 percent year-on-year.

# Exhibit 5

# THE WALL STREET JOURNAL.

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## NOTED WITH INTEREST

### The Roots of the Mortgage Crisis

Bubbles cannot be safely defused by monetary policy before the speculative fever breaks on its own.

**BY ALAN GREENSPAN**

*Wednesday, December 12, 2007 12:01 a.m.*

On Aug. 9, 2007, and the days immediately following, financial markets in much of the world seized up. Virtually overnight the seemingly insatiable desire for financial risk came to an abrupt halt as the price of risk unexpectedly surged. Interest rates on a wide range of asset classes, especially interbank lending, asset-backed commercial paper and junk bonds, rose sharply relative to riskless U.S. Treasury securities. Over the past five years, risk had become increasingly underpriced as market euphoria, fostered by an unprecedented global growth rate, gained cumulative traction.

The crisis was thus an accident waiting to happen. If it had not been triggered by the mispricing of securitized subprime mortgages, it would have been produced by eruptions in some other market. As I have noted elsewhere, history has not dealt kindly with protracted periods of low risk premiums.

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The root of the current crisis, as I see it, lies back in the aftermath of the Cold War, when the economic ruin of the Soviet Bloc was exposed with the fall of the Berlin Wall. Following these world-shaking events, market capitalism quietly, but rapidly, displaced much of the discredited central planning that was so prevalent in the Third World.

A large segment of the erstwhile Third World, especially China, replicated the successful economic export-oriented model of the so-called Asian Tigers: Fairly well educated, low-cost workforces were joined with developed-world technology and protected by an increasing rule of law, to unleash explosive economic growth. Since 2000, the real GDP growth of the developing world has been more than double that of the developed world.

The surge in competitive, low-priced exports from developing countries, especially those to Europe and the U.S., flattened labor compensation in developed countries, and reduced the rate of inflation expectations throughout the world, including those inflation expectations embedded in global long-term interest rates.

In addition, there has been a pronounced fall in global real interest rates since the early 1990s, which, of necessity, indicated that global saving intentions chronically had exceeded intentions to invest. In the developing world, consumption evidently could not keep up with the surge of income and, as a consequence, the savings rate of the developing world soared from 24% of nominal GDP in 1999 to 33% in 2006, far outstripping its investment rate.



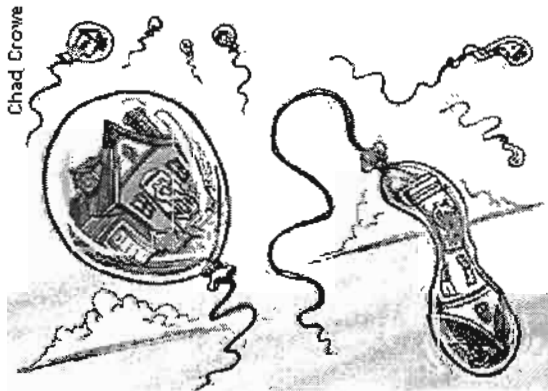
Yet the actual global saving rate in 2006, overall, was only modestly higher than in 1999, suggesting that the uptrend in developing-economy saving intentions overlapped with, and largely tempered, declining investment intentions in the developed world. In the U.S., for example, the surge of innovation and productivity growth apparently started taking a breather in 2004. That weakened global investment has been the major determinant in the decline of global real long-term interest rates is also the conclusion of a recent (March 2007) Bank of Canada study.

Equity premiums and real-estate capitalization rates were inevitably arbitrated lower by the fall in global long-term interest rates. Asset prices accordingly moved dramatically higher. Not only did global share prices recover from the dot-com crash, they moved ever upward.

The value of equities traded on the world's major stock exchanges has risen to more than \$50 trillion, double what it was in 2002. Sharply rising home prices erupted into major housing bubbles world-wide, Japan and Germany (for differing reasons) being the only principal exceptions. The Economist's surveys document the remarkable convergence of more than 20 individual nations' house price rises during the past decade. U.S. price gains, at their peak, were no more than average.



After more than a half-century observing numerous price bubbles evolve and deflate, I have reluctantly concluded that bubbles cannot be safely defused by monetary policy or other policy initiatives before the speculative fever breaks on its own. There was clearly little the world's central banks could do to temper this most recent surge in human euphoria, in some ways reminiscent of the Dutch Tulip craze of the 17th century and South Sea Bubble of the 18th century.



I do not doubt that a low U.S. federal-funds rate in response to the dot-com crash, and especially the 1% rate set in mid-2003 to counter potential deflation, lowered interest rates on adjustable-rate mortgages and may have contributed to the rise in U.S. home prices. In my judgment, however, the impact on demand for homes financed with ARMs was not major.

Demand in those days was driven by the expectation of rising prices--the dynamic that fuels most asset-price bubbles. If low adjustable-rate financing had not been available, most of the demand would have been financed with fixed rate, long-term mortgages. In fact, home

prices continued to rise for two years subsequent to the peak of ARM originations (seasonally adjusted).

I and my colleagues at the Fed believed that the potential threat of corrosive deflation in 2003 was real, even though deflation was not thought to be the most likely projection. We will never know whether the temporary 1% federal-funds rate fended off a deflationary crisis, potentially much more daunting than the current one. But I did fret that maintaining rates too low for too long was problematic. The failure of either the growth of the monetary base, or of M2, to exceed 5% while the fed-funds rate was 1% assuaged my concern that we had added inflationary tinder to the economy.

In mid-2004, as the economy firmed, the Federal Reserve started to reverse the easy monetary policy. I had expected, as a bonus, a consequent increase in long-term interest rates, which might have helped to dampen the then mounting U.S. housing price surge. It did not happen. We had presumed long-term rates, including mortgage rates, would rise, as had been the case at the

beginnings of five previous monetary policy tightening episodes, dating back to 1980. But after an initial surge in the spring of 2004, long-term rates fell back and, despite progressive Federal Reserve tightening through 2005, long-term rates barely moved.

In retrospect, global economic forces, which have been building for decades, appear to have gained effective control of the pricing of longer debt maturities. Simple correlations between short- and long-term interest rates in the U.S. remain significant, but have been declining for over a half-century. Asset prices more generally are gradually being decoupled from short-term interest rates.

Arbitragable assets--equities, bonds and real estate, and the financial assets engendered by their intermediation--now swamp the resources of central banks. The market value of global long-term securities is approaching \$100 trillion. Carry trade and foreign exchange markets have become huge.

The depth of these markets became readily apparent in March 2004, when Japanese monetary authorities abruptly ceased intervention in support of the U.S. dollar after accumulating more than \$150 billion of foreign exchange in the preceding three months. Beyond a few days of gyrations following the halt in purchases, nothing of lasting significance appears to have happened. Even the then seemingly massive Japanese purchases of foreign exchange barely budged the prices of the vast global pool of tradable securities.

In theory, central banks can expand their balance sheets without limit. In practice, they are constrained by the potential inflationary impact of their actions. The ability of central banks and their governments to join with the International Monetary Fund in broad-based currency stabilization is arguably long since gone. More generally, global forces, combined with lower international trade barriers, have diminished the scope of national governments to affect the paths of their economies.

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Although central banks appear to have lost control of longer term interest rates, they continue to be dominant in the markets for assets with shorter maturities, where money and near monies are created. Thus central banks retain their ability to contain pressures on the prices of goods and services, that is, on the conventional measures of inflation.

The current credit crisis will come to an end when the overhang of inventories of newly built homes is largely liquidated, and home price deflation comes to an end. That will stabilize the now-uncertain value of the home equity that acts as a buffer for all home mortgages, but most importantly for those held as collateral for residential mortgage-backed securities. Very large losses will, no doubt, be taken as a consequence of the crisis. But after a period of protracted adjustment, the U.S. economy, and the world economy more generally, will be able to get back to business.

*Mr. Greenspan, former chairman of the Federal Reserve, is president of Greenspan Associates LLC and author of "The Age of Turbulence: Adventures in a New World" (Penguin, 2007).*

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# Exhibit 6



April 11, 2008

HIGH & LOW FINANCE

## It's a Crisis, and Ideas Are Scarce

By FLOYD NORRIS

As the credit crisis has slowly expanded and worsened, there has been a flurry of activity in Washington to reduce the damage from it. There are bailouts and tax breaks, and even checks to parents of school-age children.

But there is remarkably little action aimed at getting the credit system functioning again.

In part, that is because there is a scarcity of ideas. Paul Volcker, the former Federal Reserve chairman whose legacy has not crumbled since he left office, was right this week when he said the financial engineers had created "a demonstrably fragile financial system that has produced unimaginable wealth for some, while repeatedly risking a cascading breakdown of the system as a whole."

But it is far from clear what should replace it, or if it can somehow be mended.

To be sure, we had a system that worked for generations, based on commercial banks constrained by regulation. But that system is not coming back, as Mr. Volcker noted in his extraordinary speech to the Economic Club of New York this week.

"Any return to heavily regulated, bank-dominated, nationally insulated markets is pure nostalgia, not possible in this world of sophisticated financial techniques made possible by the wonders of electronic technology," he said.

In any case, the banks are not all that healthy anyway, thanks to their losses from the strange securities created under the new system.

For the time being, the solutions being pushed would not seem unreasonable to an old-fashioned socialist. Most new mortgages are now guaranteed by the government or by government-sponsored enterprises, whose ability to lend is being expanded.

The Bear Stearns precedent seems to assure that investment banks have joined commercial banks in the Fed's safety net, and the Fed has now taken control over what Mr. Volcker calls "mortgage-backed securities of questionable pedigree."

Some ideas are obvious, but so far not widely accepted. The Basel II capital rules for commercial and investment banks clearly need to be strengthened, and regulators need to develop the ability to do their own risk assessments, rather than leaving the task to the banks and the credit rating agencies. That will take time and cost a lot of money, and it will require the derivative markets to be much more transparent.

Regulation needs to be strengthened, particularly for investment banks. Providing a safety net brings, in Mr. Volcker's words, "a direct responsibility for oversight and regulation." He forecast that "investment banks are going to end up with a leverage ratio imposed upon them." And one lesson of this disaster is that having parallel financial institutions — one regulated and one not — simply drives activity to the unregulated area, at least until something blows up.

But while reducing leverage is crucial, it makes a difference, as Lawrence H. Summers, the former Treasury secretary, said this week, how that is accomplished. If the banks decrease leverage by selling assets or cutting back on lending, there could be a prolonged drought of available loans to fuel the economy. It is far better for them to raise capital and keep lending, but there is little evidence now that the institutions have much willingness to do that.

Mr. Summers believes that the government-sponsored enterprises, Fannie Mae and Freddie Mac, should have been forced to raise capital quickly — rather than simply promise to do something someday — and that ways should be found to push other institutions to do so.

It is also clear that the efforts being made to cut back American regulation, in the name of making our markets more competitive, are attempts to deal with the wrong issue. To quote Mr. Volcker again, "For financial regulation in general, competition in regulatory laxity cannot be a tolerable approach."

At the same time, there is a limit to the usefulness of finger-pointing. Most of the critics — myself included — did not anticipate the severity of the credit collapse, and we should not act as if the executives and regulators who failed to prevent it were blind or stupid. Rather than go into self-defensive crouches, those people need to use hindsight to ameliorate the mess.

There is a real risk that the ad hoc efforts now being made to deal with this crisis will create other problems. Mr. Volcker, who knows how inflation can get out of hand, said the current situation reminds him of the early 1970's, when inflation began to accelerate. The Fed's moves to slash short-term interest rates and bail out Wall Street, however necessary they may be, could easily raise inflation and cause more damage to the weak dollar.

It is striking to realize that while Mr. Volcker has been gone from the Fed for two decades, he is, at 80, two years younger than his successor, Alan Greenspan. Had Mr. Volcker somehow kept the job, he almost certainly would have been more skeptical about the new financial architecture — and less popular on Wall Street — than Mr. Greenspan was when times were good. But the bad times we are now entering might not have become nearly so large a threat.

*Floyd Norris comments on finance and economics in his blog at [norris.blogs.nytimes.com](http://norris.blogs.nytimes.com).*

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# Exhibit 7

COMMENT & ANALYSIS  
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Close

## Tackle false rumours about insurance companies

Print

By Eric Dinallo

Published: July 31 2008 15:52 | Last updated: July 31 2008 15:52

Rumours that can destroy the stock price of banks and investment banks have been the focus of the media and have now attracted the attention of regulators. But what about rumours that cast doubt on the solvency of insurance companies that are equally important to the New York economy and global capital markets? All financial services companies – banks, investment banks and insurance companies – rely on market confidence. Just as a depository institution's continued existence depends on the confidence of depositors, so an insurance company's existence depends on the confidence of policyholders.

This is why New York State enacted a law in the 1930's providing for civil and criminal sanctions for spreading false rumours or making statements "untrue in fact" about an insurance company's solvency.

This law recognises that insurance companies can be destroyed by false claims that they are insolvent – that is, unable to pay their claims. Because insurers provide long-term promises of protection, falsely attacking an insurance company undermines all those promises and the economic activities that depend on them. Thus, these attacks can produce systemic harm that may extend beyond the policyholders of that company to the economy as a whole.

A prime example of the potential for widespread damage is the current case of the bond insurers, which are experiencing problems because of the subprime crisis. These companies guarantee that issuers will pay principal and interest on bonds, including municipal bonds, which are widely held by households and institutions. If the issuer of a bond cannot pay, the bond insurer steps in and pays the holder.

Recently, some individuals have asserted that some of the bond insurers are insolvent – a far more serious, far reaching and risky allegation than claims that the insurer's holding company stock is overvalued. Publicly questioning the solvency of these companies is of a completely different order. If the bond insurers, also known as financial guaranty companies, cannot pay claims, major US commercial and investment banks will likely suffer additional writedowns, the current credit crisis may get worse, and the current economic downturn could become deeper. Also, the cost of borrowing for some state and local governments may increase, resulting in reduced services or higher taxes.

This is of particular importance to New York for two reasons. First, New York is home to most of the large commercial and investment banks. Further damage to them will hurt our local economy and runs contrary to Governor David Paterson's efforts to protect New York's status as the financial center of the globe. Indeed, the financial sector downturn has already produced serious job-losses and other negative effects on the New York economy. Second, all of the major bond insurers and many other large insurance companies are located in New York State.

The New York State Insurance Department has been working with the bond insurers to resolve their problems. Our goal is not to protect managers or stockholders of these companies, but rather to promote a healthy competitive market, to ensure that bond insurance is available for municipalities that need it to lower borrowing costs, and to protect the policyholders of existing companies.

To protect policyholders, we facilitated the injection of more than \$7bn into existing bond insurers, licensed new entrants in record time, continue to facilitate additional capital infusions and are preparing for the rational wind-down, that is, run-off, of any impaired companies. We have been successful despite attacks on the stock prices of the insurance holding companies, which have made those tasks more complicated and challenging. Rumour mongering and inaccurately disparaging insurance company solvency, however, crosses a line.

indeed, solvency determination is one of the Insurance Department's most important roles. For insurance, solvency is a regulatory concept that is complicated because premiums and claims are often paid over a long period of time. Insurance has its own system of Statutory Accounting Principles that differs from Generally Accepted Accounting Principles in meaningful and logical ways. Solvency essentially means that an insurance company can pay its claims when they become due. That is a determination generally made only by the regulator based on examinations or confidential insurance company filings.

We take all these responsibilities very seriously. But our efforts could be stymied – and policy holders and all New Yorkers irreparably damaged – by false accusations as to an insurer's solvency and that is why the law does not permit it.

The author is superintendent of the New York State Insurance Department

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# Exhibit 8

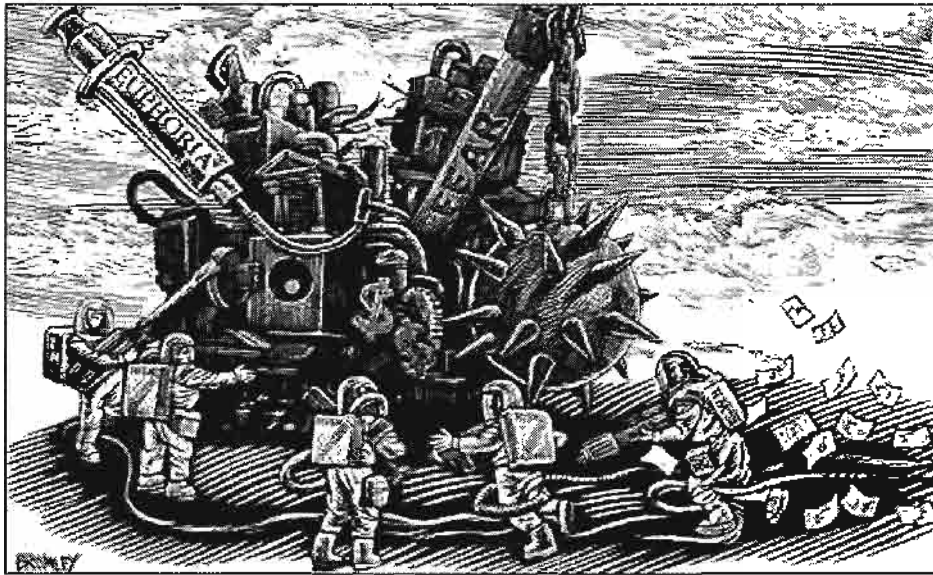


## We will never have a perfect model of risk

Print

By Alan Greenspan

Published: March 16 2008 18:25 | Last updated: March 16 2008 18:25



The current financial crisis in the US is likely to be judged in retrospect as the most wrenching since the end of the second world war. It will end eventually when home prices stabilise and with them the value of equity in homes supporting troubled mortgage securities.

Home price stabilisation will restore much-needed clarity to the marketplace because losses will be realised rather than prospective. The major source of contagion will be removed. Financial institutions will then recapitalise or go out of business. Trust in the solvency of remaining counterparties will be gradually restored and issuance of loans and securities will slowly return to normal. Although inventories of vacant single-family homes – those belonging to builders and investors – have recently peaked, until liquidation of these inventories proceeds in earnest, the level at which home prices will stabilise remains problematic.

The American housing bubble peaked in early 2006, followed by an abrupt and rapid retreat over the past two years. Since summer 2006, hundreds of thousands of homeowners, many forced by foreclosure, have moved out of single-family homes into rental housing, creating an excess of approximately 600,000 vacant, largely investor-owned single-family units for sale. Homebuilders caught by the market's rapid contraction have involuntarily added an additional 200,000 newly built homes to the "empty-house-for-sale" market.

Home prices have been receding rapidly under the weight of this inventory overhang. Single-family housing starts have declined by 60 per cent since early 2006, but have only recently fallen below single-family home demand. Indeed, this sharply lower level of pending housing additions, together with the expected 1m increase in the number of US households this year as well as underlying demand for second homes and replacement homes, together imply a decline in the stock of vacant single-family homes for sale of approximately 400,000 over the course of 2008.

The pace of liquidation is likely to pick up even more as new-home construction falls further. The level of home prices will probably stabilise as soon as the rate of inventory liquidation reaches its maximum, well before the ultimate elimination of inventory excess. That point, however, is still an indeterminate number of months in the future.



The crisis will leave many casualties. Particularly hard hit will be much of today's financial risk-valuation system, significant parts of which failed under stress. Those of us who look to the self-interest of lending institutions to protect shareholder equity have to be in a state of shocked disbelief. But I hope that one of the casualties will not be reliance on counterparty surveillance, and more generally financial self-regulation, as the fundamental balance mechanism for global finance.

The problems, at least in the early stages of this crisis, were most pronounced among banks whose regulatory oversight has been elaborate for years. To be sure, the systems of setting bank capital requirements, both economic and regulatory, which have developed over the past two decades will be overhauled substantially in light of recent experience. Indeed, private investors are already demanding larger capital buffers and collateral, and the mavers convened under the auspices of the Bank for International Settlements will surely amend the newly minted Basel II international regulatory accord. Also being questioned, tangentially, are the mathematically elegant economic forecasting models that once again have been unable to anticipate a financial crisis or the onset of recession.

Credit market systems and their degree of leverage and liquidity are rooted in trust in the solvency of counterparties. That trust was badly shaken on August 9 2007 when **BNP Paribas revealed** large unanticipated losses on US subprime securities. Risk management systems – and the models at their core – were supposed to guard against outsized losses. How did we go so wrong?

The essential problem is that our models – both risk models and econometric models – as complex as they have become, are still too simple to capture the full array of governing variables that drive global economic reality. A model, of necessity, is an abstraction from the full detail of the real world. In line with the time-honoured observation that diversification lowers risk, computers crunched reams of historical data in quest of negative correlations between prices of tradeable assets; correlations that could help insulate investment portfolios from the broad swings in an economy. When such asset prices, rather than offsetting each other's movements, fell in unison on and following August 9 last year, huge losses across virtually all risk-asset classes ensued.

The most credible explanation of why risk management based on state-of-the-art statistical models can perform so poorly is that the underlying data used to estimate a model's structure are drawn generally from both periods of euphoria and periods of fear, that is, from regimes with importantly different dynamics.

The contraction phase of credit and business cycles, driven by fear, have historically been far shorter and far more abrupt than the expansion phase, which is driven by a slow but cumulative build-up of euphoria. Over the past half-century, the American economy was in contraction only one-seventh of the time. But it is the onset of that one-seventh for which risk management must be most prepared. Negative correlations among asset classes, so evident during an expansion, can collapse as all asset prices fall together, undermining the strategy of improving risk/reward trade-offs through diversification.

If we could adequately model each phase of the cycle separately and divine the signals that tell us when the shift in regimes is about to occur, risk management systems would be improved significantly. One difficult problem is that much of the dubious financial-market behaviour that chronically emerges during the expansion phase is the result not of ignorance of badly underpriced risk, but of the concern that unless firms participate in a current euphoria, they will irretrievably lose market share.

Risk management seeks to maximise risk-adjusted rates of return on equity; often, in the process, underused capital is considered "waste". Gone are the days when banks prided themselves on triple-A ratings and sometimes hinted at hidden balance-sheet reserves (often true) that conveyed an aura of invulnerability. Today, or at least prior to August 9 2007, the assets and capital that define triple-A status, or seemed to, entailed too high a competitive cost.

I do not say that the current systems of risk management or econometric forecasting are not in large measure soundly rooted in the real world. The exploration of the benefits of diversification in risk-management models is unquestionably sound and the use of an elaborate macroeconomic model does enforce forecasting discipline. It requires, for example, that saving equal investment, that the marginal propensity to consume be positive, and that inventories be non-negative. These restraints, among others, eliminated most of the distressing inconsistencies of the unsophisticated forecasting world of a half century ago.

But these models do not fully capture what I believe has been, to date, only a peripheral addendum to business-cycle and financial modelling – the innate human responses that result in swings between euphoria and fear that repeat themselves generation after generation with little evidence of a learning curve. Asset-price bubbles build and burst today as they have since the early 18th century, when modern competitive markets evolved. To be sure, we tend to label such behavioural responses as non-rational. But forecasters' concerns should be not whether human response is rational or irrational, only that it is observable and systematic.

This, to me, is the large missing "explanatory variable" in both risk-management and macroeconomic models. Current practice is to introduce notions of "animal spirits", as John Maynard Keynes put it, through "add factors". That is, we arbitrarily change the outcome of our model's equations. Add-factoring, however, is an implicit recognition that models, as we currently employ them, are structurally deficient; it does not sufficiently address the problem of the missing variable.

We will never be able to anticipate all discontinuities in financial markets. Discontinuities are, of necessity, a surprise. Anticipated events are arbitrated away. But if, as I strongly suspect, periods of euphoria are very difficult to suppress as they build, they will not collapse until the speculative fever breaks on its own. Paradoxically, to the extent risk management succeeds in identifying such episodes, it can prolong and enlarge the period of euphoria. But risk management can never reach perfection. It will eventually fail and a disturbing reality will be laid bare, prompting an unexpected and sharp discontinuous response.

In the current crisis, as in past crises, we can learn much, and policy in the future will be informed by these lessons. But we cannot hope to anticipate the specifics of future crises with any degree of confidence. Thus it is important, indeed crucial, that any reforms in, and adjustments to, the structure of markets and regulation not inhibit our most reliable and effective safeguards against cumulative economic failure: market flexibility and open competition.

*The writer is former chairman of the US Federal Reserve and author of 'The Age of Turbulence: Adventures in a New World'*

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# Exhibit 9

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OCTOBER 12, 2008, 3:57 P.M. ET

## Europe Formulates Sweeping Crisis Plan

A WALL STREET JOURNAL ONLINE NEWS ROUNDUP

France's President Nicolas Sarkozy says countries that use the euro will temporarily guarantee bank refinancing to ease the credit crunch.

Mr. Sarkozy said the measure taken by the leaders of the 15 nations that use the currency is "not a gift to banks." He says it will be in place through the end of next year. That was one of several measures taken at an emergency summit of leaders of the 15 euro-zone countries in Paris on Sunday to find European solutions to the global financial crisis. Further details from the conference were not immediately available.

Earlier in the day, a draft statement issued at the start of the summit listed a multi-point plan designed to stabilize countries' roiling financial markets.

The sweeping plan called for euro-zone governments to issue guarantees and insurance, to buy stock in needy companies, to issue qualifying capital to financial institutions through preferred shares and other instruments and to act to stabilize long-term maturities.

The plan also called on the European Central Bank to create a facility to acquire commercial paper from financial institutions and other companies, to inject funds into cash-starved enterprises. The U.S. Federal Reserve last week set a similar plan into motion.

Euro-zone governments would also urge the ECB to keep a flexible stance in addressing the crisis. That could be interpreted as calling on the ECB to loosen monetary policy if needed.

The draft declaration welcomes the ECB's participation in a coordinated round of official interest rate cuts by major central banks last week. The ECB's measures would stay in effect through the duration of the crisis, the draft adds.

Without placing a cost on the program, or saying how it will be financed, the declaration says governments would be watchful of the interests of taxpayers and that they would assure that existing shareholders and management of companies

bailed out would bear the consequences of the government intervention.

It added that companies receiving emergency support would be restructured. It is unclear whether the final declaration will contain the same wording as the draft.

Speaking to reporters before the conference, French President Nicolas Sarkozy said he had hopes for an ambitious plan and insisted on the need for a coordinated response to the turmoil. Echoing Mr. Sarkozy's remarks, European Commission President Jose Manuel Barroso said he was very hopeful that the conference would take an important step toward a coordinated response.

"I am very hopeful that we will take an important step forward today by agreeing to a clear response for the euro area to the current crisis," Mr. Barroso said in a statement ahead of the summit. An "unprecedented level of coordination" is needed to make clear to both Europeans and the markets of the ability to act with a single voice, he said.

German Chancellor Angela Merkel, stressing the need for a "coherent, efficient and synchronized" response, said Saturday that a "common toolbox" could be the outcome of the summit. (See related article.)

Individual countries "could use these tools to respond to (their) particular situation," she said after a meeting outside Paris with Mr. Sarkozy.

"We need a common approach in Europe, but we must be able to adapt to each national situation in a flexible way," she said.

Monday is when decisions should be put into practice nationally, for Germany at least, Ms. Merkel said. She called taking things to the national level the "third step" after the summit and a weekend meeting in Washington of finance ministers from the Group of Seven — Japan, Germany, Britain, France, Italy, Canada and the United States.

President Bush later appealed for a global approach to the crisis. So far, European countries have reacted diversely.

Ireland's unilateral move to guarantee all bank deposits caught other EU nations off balance, and led to fears of a flight of capital to the Emerald Isle.

Britain then announced a £50 billion (\$88 billion) plan to partly nationalize major banks and promised to guarantee a further £250 billion of loans to shore up the banking sector. The Belgian-Dutch bank Fortis got a bailout, and so did lender Dexia SA, helped by France, Belgium and Luxembourg.

—The Associated Press and Dow Jones News Wires contributed to this article.  
**Write to** the Online Journal's editors at [newseditors@wsj.com](mailto:newseditors@wsj.com)